$costvar,\ c$
$termvar,\ x,\ y,\ z,\ f$
$baseAttackVar,\ b$
$index,\ i,\ j,\ k$

$$
\begin{array}{lll}
A,\ B,\ C,\ E & ::= & \\
& | & b \\
& | & A \odot B \\
& | & A \sqcup B \\
& | & A \rhd B \\
& | & A \multimap B \\
& | & A \circ\!\!-\!\!\circ B \\
& | & (A)
\end{array}
$$

$$
\begin{array}{lll}
T & ::= & \\
& | & b \\
& | & T_1 \odot T_2 \\
& | & T_1 \rhd T_2 \\
& | & T_1 \sqcup T_2 \\
& | & (T)
\end{array}
$$

$$
\begin{array}{lll}
\Gamma,\ \Delta,\ \Theta,\ \Phi,\ \Psi & ::= & \\
& | & \cdot \\
& | & A \\
& | & \Gamma, \Gamma'
\end{array}
$$

$\boxed{\Delta \vdash^T E}$

$$\frac{}{b \vdash^T b}\ \text{T\_VAR}$$

$$\frac{\Delta_1 \vdash^T T_1 \quad \Delta_2 \vdash^T T_2}{\Delta_1, \Delta_2 \vdash^T T_1 \odot T_2}\ \text{T\_PARA}$$

$$\frac{\Delta_1 \vdash^T T_1 \quad \Delta_2 \vdash^T T_2}{\Delta_1, \Delta_2 \vdash^T T_1 \rhd T_2}\ \text{T\_SEQ}$$

$$\frac{\Delta_1 \vdash^T T_1 \quad \Delta_2 \vdash^T T_2}{\Delta_1, \Delta_2 \vdash^T T_1 \sqcup T_2}\ \text{T\_CHOICE}$$

$\boxed{\Theta; \Phi; \Psi \vdash E}$

$$\frac{}{\cdot; \cdot; E \vdash E}\ \text{E\_VAR}$$

$$\frac{}{\cdot; E; \cdot \vdash E}\ \text{E\_VARCC}$$

$$\frac{}{E; \cdot; \cdot \vdash E}\ \text{E\_VARC}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_1 \odot E_2}\ \text{E\_PARAI}$$

$$\frac{\Theta_1; \Phi_1; \Psi_2 \vdash E_1 \odot E_2 \quad \Theta_2; \Phi_2; \Psi_1, E_1, E_2, \Psi_3 \vdash E_3}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2, \Psi_3 \vdash E_3}\ \text{E\_PARAE}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_1 \sqcup E_2}\ \text{E\_CHOII}$$

$$\frac{\Theta_1; \Phi_2; \Psi_1 \vdash E_1 \sqcup E_2 \quad \Theta_2; \Phi_1, E_1, E_2, \Phi_3; \Psi_2 \vdash E_3}{\Theta_1, \Theta_2; \Phi_1, \Phi_2, \Phi_3; \Psi_1, \Psi_2 \vdash E_3}\ \text{E\_CHOIE}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_1 \rhd E_2}\ \text{E\_SEQI}$$

$$\frac{\Theta_2; \Phi_1; \Psi_1 \vdash E_1 \rhd E_2 \quad \Theta_1, E_1, E_2, \Theta_3; \Phi_2; \Psi_2 \vdash E_3}{\Theta_1, \Theta_2, \Theta_3; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_3}\ \text{E\_SEQE}$$

$$\frac{\Theta; \Phi; \Psi_1, E_1, E_2, \Psi_2 \vdash E}{\Theta; \Phi; \Psi_1, E_2, E_1, \Psi_2 \vdash E}\ \text{E\_EXP}$$

$$\frac{\Theta; \Phi_1, E_1, E_2, \Phi_2; \Psi \vdash E}{\Theta; \Phi_1, E_2, E_1, \Phi_2; \Psi \vdash E}\ \text{E\_EXC}$$

$$\frac{\Theta; \Phi_1, E_1, \Phi_2; \Psi \vdash E_2}{\Theta; \Phi_1, E_1, E_1, \Phi_2; \Psi \vdash E_2}\ \text{E\_DUP}$$

$$\frac{\Theta; \Phi_1, E_1, E_1, \Phi_2; \Psi \vdash E_2}{\Theta; \Phi_1, E_1, \Phi_2; \Psi \vdash E_2}\ \text{E\_CONT}$$

$$\frac{\Theta; \Phi; \Psi, E_1 \vdash E_2}{\Theta; \Phi; \Psi \vdash E_1 \multimap E_2}\ \text{E\_IMPI}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash E_1 \multimap E_2 \quad \Theta_2; \Phi_2; \Psi_2 \vdash E_1}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_2}\ \text{E\_IMPE}$$

$$\frac{\Theta_2; \Phi_1; \Psi_1 \vdash E_1 \multimap E_2 \quad \Theta_1; \Phi_2; \Psi_2 \vdash E_2 \multimap E_3}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash E_1 \multimap E_3}\ \text{E\_COMP}$$

$$\frac{\Theta_1, \Theta_2; \Phi; \Psi \vdash E \quad \Delta \vdash^T T}{\Theta_1, T, \Theta_2; \Phi; \Psi \vdash E}\ \text{E\_WEAKS}$$

$$\frac{\Theta; \Phi_1, \Phi_2; \Psi \vdash E \quad \Delta \vdash^T T}{\Theta; \Phi_1, T, \Phi_2; \Psi \vdash E}\ \text{E\_WEAKC}$$

$$\frac{\Theta; \Phi; \Psi_1, \Psi_2 \vdash E \quad \Delta \vdash^T T}{\Theta; \Phi; \Psi_1, T, \Psi_2 \vdash E}\ \text{E\_WEAKP}$$

$$\frac{\cdot \vdash^T T_1 \odot (T_2 \rhd T_3)}{\cdot; \cdot; \cdot \vdash (T_1 \odot (T_2 \sqcup T_3)) \circ\!\!-\!\!\circ ((T_1 \odot T_2) \sqcup (T_1 \odot T_3))}\ \text{E\_DISTPARA1}$$

$$\frac{\cdot \vdash^T T_1 \rhd (T_2 \sqcup T_3)}{\cdot; \cdot; \cdot \vdash (T_1 \rhd (T_2 \sqcup T_3)) \circ\!\!-\!\!\circ ((T_1 \rhd T_2) \sqcup (T_1 \rhd T_3))}\ \text{E\_DISTSEQ1}$$

$$\frac{\cdot \vdash^T (T_2 \rhd T_3) \odot T_1}{\cdot; \cdot; \cdot \vdash ((T_2 \sqcup T_3) \odot T_1) \circ\!\!-\!\!\circ ((T_2 \odot T_1) \sqcup (T_3 \odot T_1))}\ \text{E\_DISTPARA2}$$

$$\frac{\cdot \vdash^T (T_2 \sqcup T_3) \rhd T_1}{\cdot; \cdot; \cdot \vdash ((T_2 \sqcup T_3) \rhd T_1) \circ\!\!-\!\!\circ ((T_2 \rhd T_1) \sqcup (T_2 \rhd T_1))}\ \text{E\_DISTSEQ2}$$

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Definition rules:          27 good    0 bad
Definition rule clauses:   50 good    0 bad
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